REMARKS

The Office Action mailed on 16 December 2003 has been received and reviewed. Claims 1 through 23 are currently pending in the application. Claims 1-23 stand rejected under 35 USC 103(a) over Prevost alone or in view of Hass or Dickenson.

REJECTION UNDER 35 USC 103(A):

Claims 1-23 stand rejected under 35 USC 103(a) over Prevost alone or in view of Hass or Dickenson. Applicant respectfully traverses the rejections.

As noted by the Examiner on Page 2 of his Action, Prevost "does not specifically mention a homogeneous mass of a particular granular material "being used as an infill material. Specifically, the reference teaches the infill material as being a mix of sand and resilient material.

In contrast to the teachings of Prevost, the instant Claims 1-23 specify that the infill material consists of a substantially homogeneous mass of a granular material chosen from the group consisting of polyolefin-based materials and vinyl-polymer based materials. The Haas and Dickenson references do not appear to suggest or teach that the infill may be homogenous in nature. It follows that the instant rejection rests on the question of whether it would have been obvious to modify the composition of the Prevost infill to consist solely of a homogenous infill material. In Applicant's view the cited art neither teaches nor suggests, either individually or in combination, an infill which is formed of a homogenous mass of material chosen from the group consisting of polyolefin-based materials and vinyl-polymer based materials.

The Examiner maintains that it would have been obvious to modify the infill of Prevost depending on the end use of the synthetic surface being fabricated. More specifically, the Examiner submits that more rubber could be used if the surface requires more resiliency. In this regard the Examiner refers to col. 8, lines 1-3 of the Prevost specification.

Applicant respectfully disagrees with the Examiner's conclusions. In support of the Applicant's position, applicant appends hereto as Annexes A, B, and C, three graphs which

summarize tests conducted on three distinct playing surfaces, namely a natural grass surface, a surface covered with a synthetic grass having an infill composed of sand and EPDM rubber and a surface covered with a synthetic grass fabricated according to the claims of the instant invention. The attached annexes illustrate the performance characteristics of three distinct playing surfaces.

Each of the attached graphs includes two lines, i.e. A and B, which document the results produced by a so-called "artificial athlete" test. An "artificial athlete" is an instrument adapted to reproduce the interaction of a surface being treaded upon with the legs/feet of an athlete walking/running on that surface. Essentially, an artificial athlete is comprised of a structure adapted to be placed on the surface to be tested and carrying a weight, e.g. 11.5 kilograms, that is dropped onto the surface from a given height, e.g. 125 mm. Thereafter, the trajectory of the weight and the resultant forces produced by the falling weight are measured.

It is applicant's intention to submit a Declaration in support of the attached test results within the next several days to further complete the file in this application..

In the attached graphs the line A is representative of the trajectory of the weight which is dropped onto the surface being tested. The weight is subject to repeated dampened bouncing, due to the at least partially elastic nature of the surface. Line B represents the force exerted by the lower face of the weight onto the surface being tested and by way of reaction, the force exerted by the surface onto the lower face of the weight. The curves A and B are considered to be particularly significant in identifying the biomechanical performance characteristics of the surface being tested.

Annex A illustrates the data obtained from performing the artificial athlete test on a natural grass court surface located at Paschiero Stadium, Cuneo, Italy.

Annex B illustrates the test data obtained from conducting the artificial athlete test on a soccer court located at Luigi Stadium, Trieste, Italy. This soccer court is equipped with a synthetic turf surface having an infill essentially comprised of a mixture of Astroturf EPDM rubber and sand. In essence, this soccer court was equipped with a synthetic surface whose infill corresponds structurally to the infill made subject to the Prevost patent.

The graph of Annex C presents data accumulated from conducting an artificial athlete test on a soccer court located at Gallo d'Alba, in Cuneo, Italy which was equipped with a synthetic turf including an infill having the characteristics made subject to claims 1-23 of the instant application.

Initially, it should be appreciated that the instant claimed infill is directed to producing a surface which substantially reproduces the biomechanical behavior of a natural grass surface. More specifically, applicant's invention is directed to a polyolefin-based and vinyl-polymer based infill material which exhibits a visco-elastic behavior, i.e. a damped elastic behavior, which is ideally suitable for use as a particulate infill material for a synthetic grass cover or turf.

In comparing the graphs of Annex A with that of Annex B, namely the natural grass turf of Annex A with the Astroturf (EPDM and Sand turf) of Annex B, it immediately becomes obvious that the resilient effect of the Astroturf is much higher than that exhibited by the natural grass. For example a comparison of the trajectory of the weight during the first bounce after the weight's initial impact on the surface shows the weight achieving a height of approximately 120mm/10 in the case of the natural grass surface while the weight achieves a height of almost 320mm/10 in the case of the Astroturf surface. It follows that the Astroturf surface produces a reaction which is nearly three times the reaction produced by the natural grass surface. Further, the Astroturf surface produces a second bounce at 2800 msec which reaches a height of approximately 85 mm/10 in comparison to the second bounce produced by the grass surface of approximately 0 mm/10. In addition, the Astroturf surface produces a third bounce which is largely not matched by the natural grass surface. Not only are the magnitudes of the height of the bounces between the two surfaces quite different, but furthermore, the timing of the bounces is also quite different with the natural grass surface achieving a steady state condition much more quickly than the Astroturf surface.

Under the rationale suggested by the Examiner, a workman of ordinary skill in the art, would have been motivated to eliminate the sand component from the infill of the Astroturf

surface in order to produce an Astroturf structure configured to achieve the biomechanical characteristics of a natural grass surface. Applicant respectfully disagrees with this suggestion.

As shown by a comparison of the two graphs, the Astroturf construction already exhibits an excessive springy behavior, i.e. an excessive resiliency. The excessive resiliency produced by the Astroturf is considered undesirable in the art in that it leads to producing fatigue on the part of players using the surface as well as an unnatural bouncing action on the part of the ball being used during an athletic event. This latter consideration can dramatically effect player performance on the synthetic surface. The excessive resiliency appears to be produced by the EPDM rubber component of the infill. The sand component of the infill, being substantially incompressible, appears to operate more as a dampening agent than as a resiliency agent. Stated otherwise, the sand in the Astroturf infill performs a dampening function in contrast to the resiliency function of the EPDM rubber.

Remembering that the desired objective of the instant invention is to simulate the performance characteristics of a natural grass surface, logic would dictate that the workman of ordinary skill, faced with the excessive resiliency characteristics of the Astroturf surface and the need to reduce the resiliency of the Astroturf in order to better simulate the performance characteristics of the natural grass surface, would have increased the amount of dampening material in the infill in order to reduce the excessive resiliency exhibited by the infill. Alternatively, the said workman would have reduced the amount of resilient material in the infill. Under either approach, logic would dictate that the ratio of sand to EPDM rubber would have needed to be increased in order to reduce the resiliency of the EPDM component of the infill. It follows that the natural course of action which a workman of ordinary skill would follow under the circumstances would be to increase the ratio of the amount of dampening material (sand) in the infill as opposed to eliminate that dampening sand from the infill as suggested by the Examiner

To follow the Examiner's suggestion and eliminate the sand and thereby decrease the ratio of dampening sand material to resilient rubber material would appear to go against logic.

Eliminating the dampening agent would seemingly only exacerbate the problem by making the infill even more resilient than it was initially. Applicant respectfully submits that the only logical step under the circumstances would have been to increase the ratio of the amount of sand in comparison to the amount of EPDM rubber in the infill.

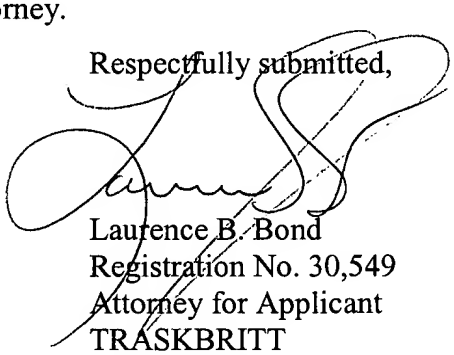
Notwithstanding the apparent lack of motivation to do so, applicant discovered the unexpected result which follows from eliminating the sand and fabricating a homogenous infill from material chosen from polyolefin-based and vinyl-based materials. As shown by Annex C, a synthetic surface fabricated according to the claims of the instant application exhibits biomechanical performance characteristics which substantially simulate those of a natural grass surface, as exhibited in Annex A. Not only are the magnitudes of the bounce heights quite similar in both instances, but furthermore the time intervals for corresponding bounces are similar as well for each of the two surfaces.

In brief, the surface of the instant claims substantially duplicates the performance characteristics of the natural grass surface. Furthermore, the duplication of those performance characteristics would not have been expected from altering a synthetic surface of the type represented by the Astroturf construction by eliminating the sand component from that construction. It follows that the instant claims satisfy the requirement of nonobviousness as set forth in 35 USC 103(a).

CONCLUSION

Claims 1 through 23 are believed to be in condition for allowance, thus reconsideration thereof is respectfully requested. If any issues preventing the allowance of the above-referenced application remain that might be resolved by way of a telephone conference, the Office is kindly invited to contact the undersigned attorney.

Respectfully submitted,



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25 June 2004
Enc: Annexes A, B and C

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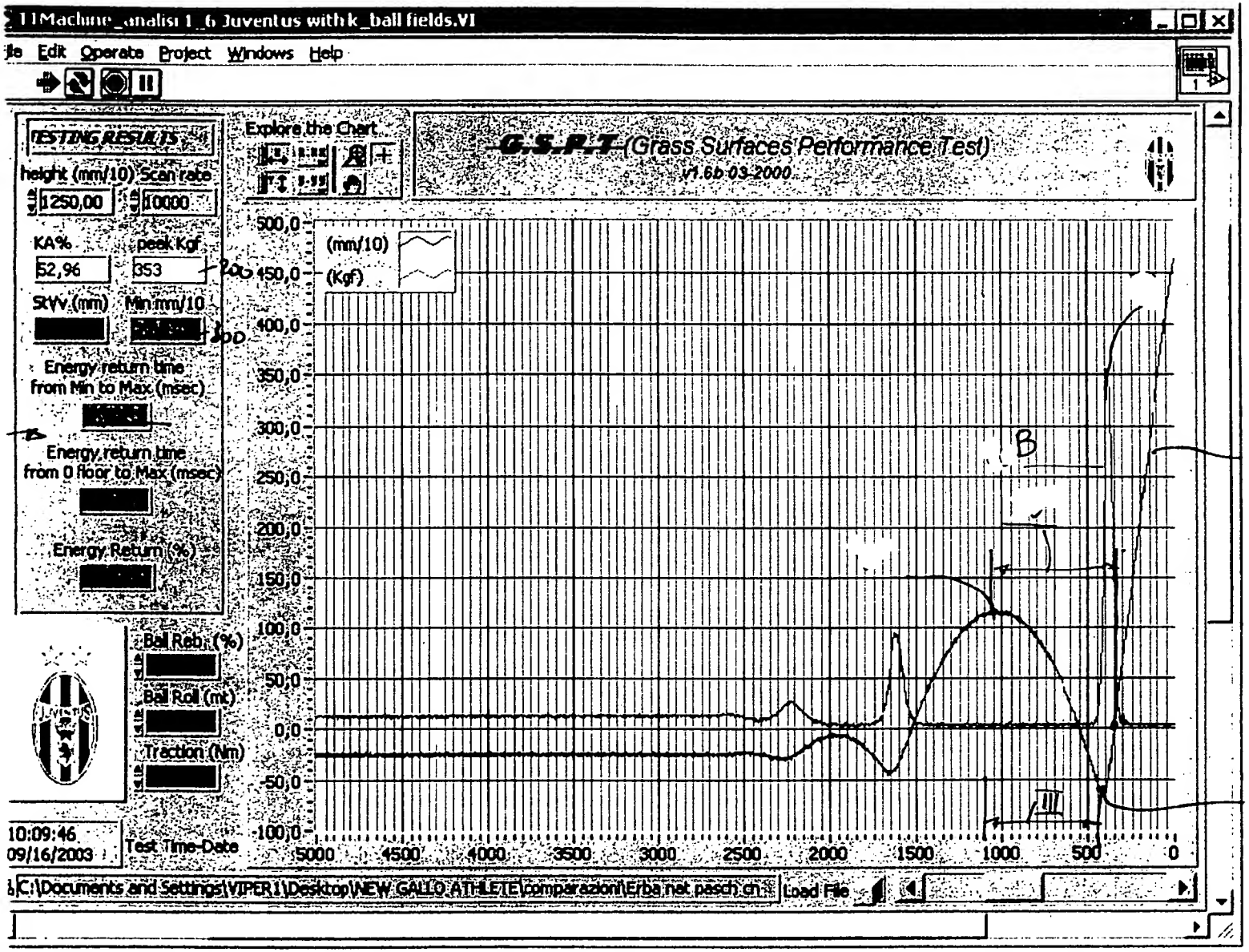
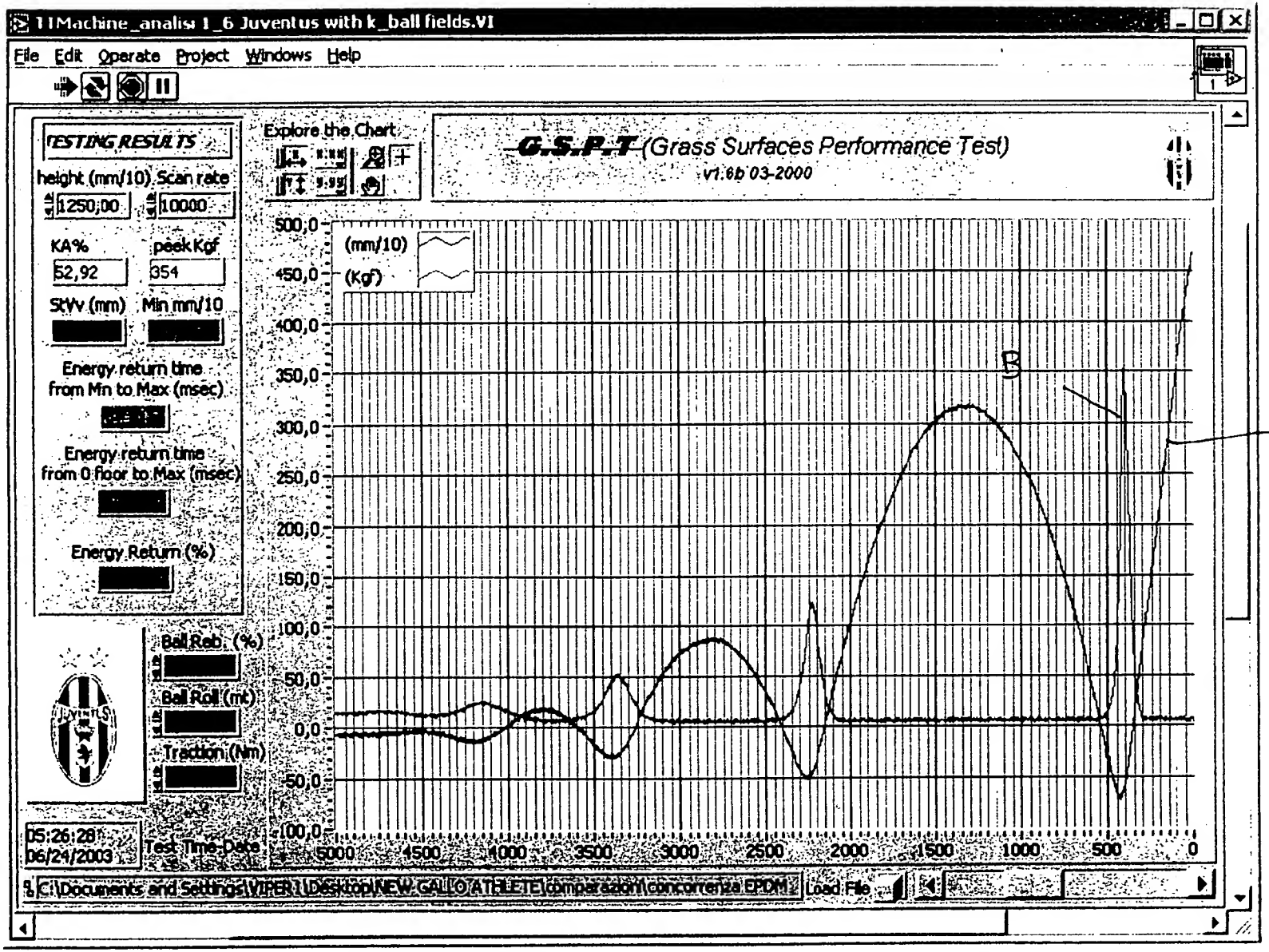
Annex A



A

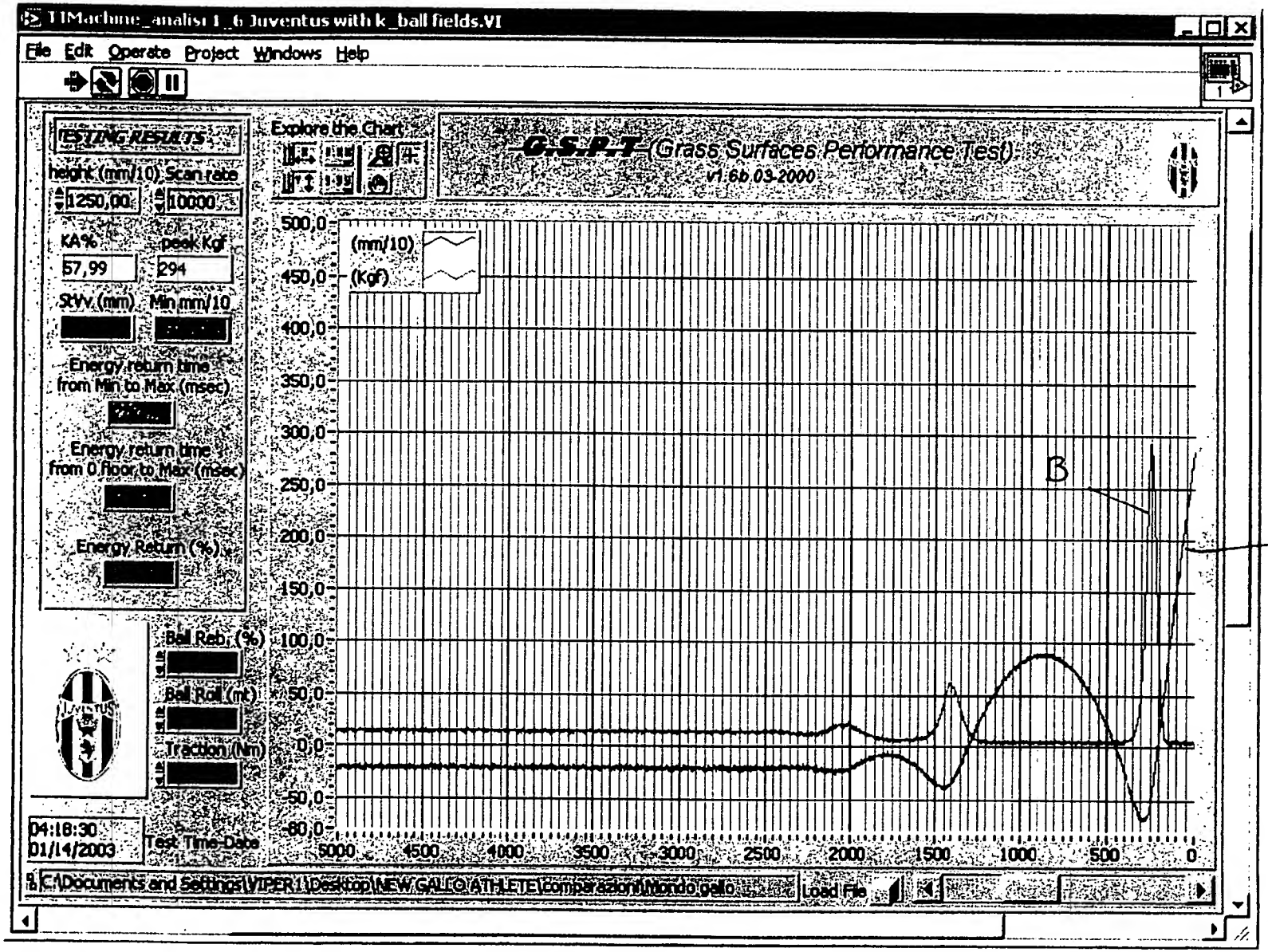
: Campo in erba naturale, stadio Paschiero (Cuneo)

Annex E



E: Campo S.LUIGI Trieste, Astroturf EPDM + sabbia

Annex C



B: Mondoturf Ecofill, Gallo d'Alba